

CLAIMS

1. A heat-resistant concrete comprising aggregates embedded with a cementing matrix based on Portland cement and on mineral additives contributing silicon, calcium and aluminum oxides, so that the mineral composition of the matrix mixture lies in the [xonotlite/wollastonite]-grossular-anorthite triangle or in the grossular-anorthite-quartz triangle in the Si-Ca-Al phase diagram, so that the formation of anorthite is promoted when the set concrete is exposed to temperatures between 250°C and 1200°C.
2. The concrete of claim 1, wherein the mineral composition of the matrix mixture lies in the area overlapping both the [xonotlite/wollastonite]-grossular-anorthite triangle and the grossular-anorthite-quartz triangle in the Si-Ca-Al phase diagram.
3. The concrete according to any of claims 1 to 2, wherein the aggregates are heat-resistant.
4. The concrete according to any preceding claims, wherein the mineral additives further contribute iron and/or magnesium.
5. The concrete according to claim 4, wherein the cumulative amount of iron oxides and of magnesium oxides is between 1 and to 5% of the total weight of the mineral composition.
6. The concrete according to any preceding claims wherein all solids constituting the cementing matrix are provided in at least three distinct particle size fractions in volume ratio such that the packing volume fraction of the solids is optimized.
7. The concrete according to any preceding claims, wherein at least part of the mineral additives is added under the form of alumino-silicate hollow spheres to favor escape of vapor pressure when the concrete is submitted at high temperature.